

## ABSTRACT

The invention relates to self-contained assay cassette for detecting a ligand in a sample. The assay cassette provides for turbulent flow and mixing of the sample with assay components, including receptors that bind to a ligand, optional microspheres capable of binding the receptors or to which other secondary receptors are attached, and liquid crystalline materials. The assay cassette also provides for laminar flow of the mixed sample into a detection chamber where complexes between a receptor, ligand, and optional microspheres, is detected as transmission of polarized light through the detection chambers. The invention also relates to methods for detecting a ligand in a sample using turbulent flow to mix the sample with assay components, including liquid crystalline materials, and laminar flow of the mixed sample such that the liquid crystalline material assumes an ordered conformation in absence of a ligand.